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MAR 20 2007

CLAIM SCHEDULE

CLAIMS

1. (As Amended) A method of making a gel which is not water soluble comprised of making a water soluble polymer of an acrylic acid compound comprising:

combining an acrylic acid compound with a reactant selected from the group consisting of a divalent metal salt of said acrylic acid compound, a monovalent metal salt of said acrylic acid compound and mixtures thereof to form a polymer precursor,

combining a polymerization initiator with said precursor ,

permitting said precursor to form said water soluble polymer, and

combining said water soluble polymer with a cross linking agent to form said gel;

wherein

said polymer precursor contains in the range of from about 0.65 to about 2.75 units of said divalent metal salt of said acrylic acid compound per unit of said acrylic acid compound and in the range of from about 0 to about 2.25 units of said monovalent metal salt of said acrylic acid compound per unit of said acrylic acid compound, and

said acrylic acid compound is represented by the formula $\text{CH}_2=\text{CR}-\text{COOH}$ and R is hydrogen or a methyl group

and further wherein

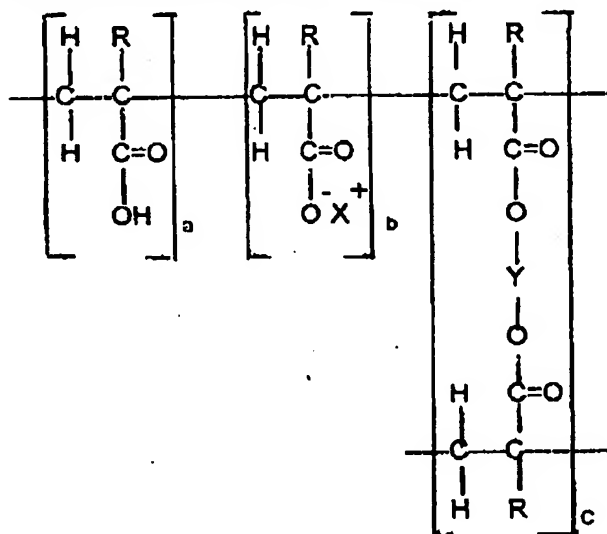
said gel is stable at temperatures up to about 450 degrees Fahrenheit.

2. (Original) The method of claim 1 wherein said polymerization initiator is a free radical initiator.

3.(Canceled) The method of claim 2 wherein said water soluble polymer is combined with a cross linking agent to form a gel which is not water soluble and is stable at temperatures up to about 450 degrees Fahrenheit.

- 68 4. (As Amended) The method of claim 2 wherein said cross linking agent is a compound
69 containing a trivalent metal.
- 70 5. (As Amended) The method of claim 2 wherein said cross linking agent is a compound
71 containing chromium having a valence of + 3.
- 72 6. (Original) The method of claim 2 wherein said acrylic acid compound is acrylic acid, said
73 divalent metal salt is magnesium acrylate and said monovalent metal salt is an alkali metal
74 acrylate.
- 75 7. (Original) The method of claim 5 wherein said divalent metal salt is the reaction product of
76 acrylic acid and a magnesium compound selected from magnesium oxide, magnesium
77 hydroxide and magnesium carbonate and said monovalent metal salt is the reaction product of
78 acrylic acid and a sodium compound selected from sodium oxide, sodium hydroxide and
79 sodium carbonate.
- 80 8. (Original) The method of claim 7 wherein said cross linking agent is chromium acetate, said
81 sodium compound is sodium hydroxide and said magnesium compound is magnesium
82 hydroxide.
- 83 9. (Withdrawn From Consideration) The product of the method of claim 6.
- 84 10. (Withdrawn From Consideration) The product of the method of claim 8.

11. (Withdrawn From Consideration) A composition of matter represented by the formula



wherein

R is independently H and $-\text{CH}_3$; X is Na, K, Li, Rb, Cs, or NH_3 ; Y is Be, Mg, Ca, Sr, B or Zn; a is 1, b has a value in the range of from 0 to about 2.25 and c has a value in the range of from about 0.65 to about 2.75.

12. (As Amended) A method of making a gel which is not water soluble comprised of making a water soluble polymer comprising:

forming a polymer precursor by mixing an acrylic acid compound with a material selected from the group consisting of a divalent metal compound, a monovalent metal compound and mixtures thereof,

combining a polymerization initiator with said precursor,

permitting said precursor to form said water soluble polymer and

combining said water soluble polymer with a cross linking agent to form said gel;

wherein

the ratio of said monovalent metal compound to said acrylic acid compound in said

precursor is an amount in the range of from about 0 to about 0.5 moles of said monovalent metal compound per mole of said acrylic acid compound and the ratio of said divalent metal compound to said acrylic acid compound in said precursor is an amount in the range of from about 0.15 to about 0.5 moles of said divalent metal compound per mole of said acrylic acid compound;

said acrylic acid compound is represented by the formula $\text{CH}_2=\text{CR}-\text{COOH}$ wherein R is hydrogen or a methyl group;

said monovalent metal compound is represented by the general formula X_NM and said divalent metal compound is represented by the general formula YM_Z wherein Y is beryllium, magnesium calcium, strontium, barium or zinc; X is sodium, potassium, lithium, rubidium, cesium or an ammonia group; M is oxygen, a hydroxide group or a carbonate group; Z is 1 or 2, and N is 1 or 2; and

said gel is stable at temperatures up to about 450 degrees Fahrenheit.

13. (Original) The method of claim 12 wherein R is hydrogen, X is sodium, Y is magnesium, M is a hydroxide group, Z is 2, and N is 1.

14. (Original) A method of adjusting the permeability of a subsurface formation to regulate the flow of water in said formation, said method being comprised of the steps of introducing into said subsurface formation a gel which is not water soluble and is stable at temperatures up to about 450 degrees Fahrenheit, wherein said gel is made by the steps of

combining an aqueous solution of acrylic acid with a reactant selected from the group consisting of an alkaline earth metal salt of acrylic acid, an alkali metal salt of acrylic acid and mixtures thereof to form a polymer precursor,

combining a polymerization initiator with said precursor and permitting said precursor to form a water soluble polymer and thereafter,

133 combining said water soluble polymer with a cross linking agent to form said gel;

134 wherein

135 said acrylic acid, said alkaline earth metal salt and said alkali metal salt are combined in
136 a ratio in the range of from about 0.65 to about 2.75 units of said alkaline earth metal salt per
137 unit of said acrylic acid and in the range of from about 0 to about 2.25 units of said alkali metal
138 salt per unit of said acrylic acid.

139 15. (Original) The method of claim 14 wherein said alkaline earth metal salt is magnesium
140 acrylate and said alkali metal salt is sodium acrylate.

141 16. (Original) A method of adjusting the permeability of a subsurface formation to regulate the
142 flow of water in said formation, said method being comprised of the steps of introducing into
143 said subsurface formation a gel which is not water soluble and is stable at temperatures up to
144 about 450 degrees Fahrenheit, wherein said gel is made by the steps of

145 forming a polymer precursor by mixing acrylic acid with a material selected from the
146 group consisting of magnesium hydroxide, sodium hydroxide and mixtures thereof,

147 combining a polymerization initiator with said precursor and permitting said precursor to
148 form a water soluble polymer and thereafter,

149 combining said water soluble polymer with a cross linking agent to form said gel;

150 wherein

151 the ratio of said sodium hydroxide to said acrylic acid in said precursor is an amount in
152 the range of from about 0 to about 0.5 moles of said sodium hydroxide per mole of said acrylic
153 acid and the ratio of said magnesium hydroxide to said acrylic acid in said precursor is an
154 amount in the range of from about 0.15 to about 0.5 moles of said magnesium hydroxide per
155 mole of said acrylic acid.